Abstract

Thesis Project: The Importance of Brain Glycogen during Acute Seizure Activity in Mice

Student: Melissa Riegle

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College: Sciences and Humanities

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Seizure activity is the primary symptom in a common but very serious neurological disorder known as epilepsy. Brain glycogen is utilized for neuronal function, prompting us to investigate the role of brain glycogen during seizure activity in mouse models. Seizures were induced with Pentylenetetrazole (PTZ) in both wild-type mice and mice lacking brain glycogen (MGSKO/GSL30 mice). A time course of brain glycogen utilization after onset of seizure activity revealed a reduction of brain glycogen in wild-type mice. The glycogen synthase activity ratio increased after onset of seizure activity, while the glycogen phosphorylase activity ratio remained constant. Brain and blood glucose levels increased after seizure onset in wild-type mice. Despite lacking brain glycogen, MGSKO/GSL30 mice exhibited acute seizure activity. No differences were observed in seizure intensity, onset time, and duration between genotypes. These findings suggest that brain glycogen is important, but not required for PTZ-induced acute seizure activity in mice.